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The Role Of Gold As A Safe Haven Asset During Financial Crises: Evidence From The Covid-19 Pandemic & The 2008 Global Financial Crises

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1.1 Introduction

Financial crises, characterized by severe disruptions in economic stability, have historically prompted investors to seek refuge in assets that can preserve value amidst market turmoil. Gold, with its long-standing reputation as a store of value, has often been regarded as a "safe haven" asset—an investment that retains or increases in value during periods of financial instability (Baur & Lucey, 2010). Two major occurrences that tested the resilience of global financial systems were the 2008 Global Financial Crisis and the COVID-19 pandemic. These events trigger a significant drop in stock markets, fluctuations in crude oil prices and volatility in exchange rates. During these crisis, Scholars, investors and policymakers all paid close attention to gold's performance, raising questions on its dependability as a hedge against uncertainty.

The S&P 500 fell by around 38% during the 2008 financial crisis which was sparked by the collapse of Lehman Brothers while during the same period gold prices increased by almost 25% (World Gold Council ,2020). Similarly, Gold hit an all-time record of $2075 per ounce in August during the COVID 19 pandemic, amid unprecedented economic instability and volatility in the stock market (Beckmann et al., 2021). These incidents underscore how gold can stabilize the portfolios, but because of the short-term volatility and shifting macroeconomic conditions its efficacy as a safe heaven asset remains still as a matter of debate (Baur & McDermott, 2010).

This paper seeks to empirically examine the role of gold during these two crises by analysing the investor reactions, price behaviour relative to stock markets, crude oil and exchange rates and the asset's hedging capabilities.

1.2 Importance and Significance

The importance of this study lies both in the theoretical knowledge and real-world applications. Theoretically, it builds on the expanding corpus of research on safe heaven assets, a concept first rigorously defined by Baur and Lucey (2010) as assets that shows little to zero correlation with stocks or equities during the time of crisis. Due to Gold's Unique qualities- like limited supply, widespread acceptance and historical resilience- gold is a strong prime candidate for this function, yet empirical data evidence from various crisis contexts is still conflicting (Beckmann et al., 2015). By comparing the performance of gold during the credit driven 2008 crisis and the pandemic induced 2020 slump is compared to understand the gaps about how gold's safe haven qualities change under different economic shocks.

Practically, the findings hold critical implications for investors and portfolio managers seeking to mitigate risks during financial crises. With global markets increasingly prone to disruptions—whether from economic recessions, geopolitical tensions, or pandemics—understanding gold's behavior can inform asset allocation strategies (World Gold Council, 2021). For policymakers, insights into gold price dynamics and investor demand during crises can guide monetary and fiscal responses aimed at stabilizing economies. Kerala, with its cultural affinity for gold and high financial literacy, offers a regional lens to contextualize these global trends, though this study adopts a broader, international perspective using widely recognized financial datasets.

1.3 Research Objectives

- To examine whether gold was a safe haven investment during the COVID -19 pandemic and 2008 Global Financial Crisis.
- To analyse the performance of gold prices relative during these two crises in relation to stock market indices, crude oil prices, and exchange rates.
- To assess the volatility of gold prices during periods of financial instability.
- To explore investor behavior and portfolio allocation strategies during these crises.

- To compare the effectiveness of gold as a safe haven asset across the two crises.

1.4 Hypotheses

- H1: Gold prices showed low volatility than crude oil prices and stock market indices during the crisis.
- H2: Gold prices rose significantly during the stock market downturns, indicating it serves as a safe haven asset
- H3: Gold served as a useful hedge against inflation and currency depreciation during the crisis.
- H4: Gold's haven qualities were more noticeable during COVID 19 pandemic as compared to the 2008 financial crisis.

These hypotheses were supported by prior research including Baur and McDermott (2010), which found gold to be a safe haven during severe market downturns and Beckmann et al. (2015) which emphasized contextual differences in gold's performance.

1.5 Methodology of the Study

The study employs a quantitative research design using time series data from January 2007 to December 2009 (2008 financial crisis) and January 2019 to December 2021 (COVID-19 pandemic) to evaluate gold's role as a safe haven asset. Gold prices are sourced from the World Gold Council and LBMA, while stock market indices (S&P 500, Nifty 50, FTSE 100), crude oil prices (WTI, Brent), exchange rates (USD/INR, USD/GBP, EUR/USD), and inflation data (CPI) are obtained from exchange databases, EIA, FRED, and national statistical agencies. Analytical methods include descriptive statistics, Pearson's correlation, Granger causality tests, Johansen cointegration analysis, GARCH models for volatility, event study analysis of key crisis events (e.g., Lehman Brothers collapse, WHO pandemic declaration), and portfolio simulations to assess gold's risk mitigation.

2. Literature Review

In financial literature, the concept of gold as a safe haven asset has been thoroughly examined, particularly in the relation of economic crises. A safe haven asset is one that low or no correlation with riskier assets like equities, and maintains or even rises in value during times of market turmoil (Baur & Lucey, 2010). This paper summarizes the existing research on gold's performance during the financial crises, emphasizing on the investor behavior, hedging capabilities and volatility. For analyzing the gold's role during the 2008 Global Financial Crisis and COVID -19 pandemic the studies are divided into National Studies and International Studies.

2.1 National Studies

In the context of India, gold has a unique position because of the cultural significance and economic status as a preferred investment asset. In the midst of financial instability research has looked more closely as its safe haven qualities.

From 2005 to 2015, including the 2008 financial crisis, Jain and Biswal (2016) investigated the dynamic relationship between gold prices, crude oil prices, stock market indices (Nifty 50). They discovered, using a threshold vector autoregression model, gold prices exhibited a negative correlation with the Nifty 50 at times of severe market declines which indicating that it might be a safe haven. However, they noted short term fluctuations in gold prices during the time of liquidity crisis, indicating that its safe haven status might vary depending on the situation.

Kumar (2020) examined the role of gold in India during COVID 19 pandemic by examining the daily data from January 2020 to December 2020. Gold's attraction as a safe haven was further reinforced by the use of GARCH models to assess volatility which found that gold prices were less volatile than the Nifty 50. Additionally, Kumar saw a sharp rise in demand for gold driven by investor flight to safety and rupee depreciation which was consistent with global trends but was made worse by India's heavy reliance on gold imports.

Tripathi and Todankar (2021) investigated gold as a hedge against inflation and currency depreciation in India for a 20-year period from 2000-2020 which includes both 2008 financial crisis and COVID 19 pandemic. Their cointegration analysis showed a long-term correlation between gold prices and the Consumer Price Index (CPI), by supporting its use as a inflation hedge. However, they warn that speculative trading in gold futures markets was occasionally jeopardized its safe haven properties, especially in the early phases of the COVID-19 crisis. These national studies emphasize the relevance of gold in Indian Financial system, but they also underscore variations in its efficacy as a safe haven across different market conditions and crisis.

2.2 International Studies

International research gives a more comprehensive view on gold's haven status, with seminal studies laying the theoretical and empirical groundwork for the study. Baur and Lucey (2010) conducted a groundbreaking study on gold's function as a hedge and safe haven, and examined the gold's correlation with stock and bond markets in the United States, the United Kingdom, and Germany between 1995 and 2005, including pre- and post-2008 crisis periods. Using a regression-based approach they found that gold has a negative correlation with the S&P 500 and FTSE 100 which concludes that gold acted as a safe haven during extreme stock market declines. However, this was temporary, lasting 15

trade days, suggesting that gold's safe haven properties are ephemeral.

Baur and McDermott (2010) expanded the analysis to a worldwide level covering 1979 to 2009, and including the 2008 financial crisis. According to the findings of the research gold is a safe haven for developed markets but not always for emerging markets or during non- crisis periods. They underlined the importance of gold's sensitivity to macroeconomics factors like interest rates and currency strength.

Beckmann et al. (2015) used a smooth transition regression model in order to evaluate gold's hedging and its safe haven qualities across several crisis in between 1980-2012, including 2008 financial crisis. They came with a conclusion that, although its efficacy is differed by regions and crisis types, it served as a safe haven during severe downturns and as a hedge against stocks during stable times. Notably, they discovered more evidence of safe haven during equity driven crisis like 2008 compared to inflation driven ones.

More recently, Akhtaruzzaman et al. (2021) examined the gold data on a daily basis from January 2020 to June 2020 to analyse the performance of gold during the COVID 19 pandemic across key markets (FTSE 100, S&P 500). As per their conclusion and their dynamic conditional correlation (DCC-GARCH) model Gold lost its image as a safe haven due to a liquidity crunch in March 2020, but it regained it as markets calmed and reached a peak of $2,075 per ounce. This study highlights the unprecedented uncertainty of the pandemic as a driver of gold's resurgence.

Klein (2017) applied GARCH models using daily data to analyse the volatility of gold in relation to stocks and crude oil during the 2008 crisis. The results indicated that gold showed less volatility than S&P 500 and WTI crude oil specifying its stabilizing role. But according to Klein, gold's volatility spiked during the early stages of the crisis which tempered the asset's dependability as a safe haven.

3. Data Analysis

Time series data analysis has employed from January 2019 to December 2021(COVID 19). Data sources include the London Bullion Market Association (LBMA) for gold prices, Federal Reserve Economic Data (FRED) for stock indices (S&P 500), exchange rates (USD/INR), and inflation (U.S. CPI), and the U.S. Energy Information Administration (EIA) for crude oil prices (WTI). The methodology encompasses descriptive statistics, correlation analysis, GARCH modeling for volatility, and event study analysis to address the research objectives and test the hypotheses (H1–H4).

The dataset comprises daily closing prices and monthly aggregates for several variables, including LBMA gold prices (USD per ounce), S&P 500 Index (points), WTI crude oil spot prices (USD per barrel), USD/INR exchange rates (rupees per dollar), and U.S. Consumer Price Index (CPI, index level). It covers two time periods: the 2008 Global Financial Crisis from January 1, 2007, to December 31, 2009 (approximately 756 trading days), and the COVID-19 pandemic from January 1, 2019, to December 31, 2021 (approximately 756 trading days). Daily returns are calculated as $R_t = \ln(P_t) - \ln(P_{t-1})$, where P_t is the closing price on day t, and missing data, such as holidays, are addressed through linear interpolation to maintain consistency with financial time-series conventions.

Table 1: Descriptive Statistics

Variable	Period	Mean Return (%)	Std. Dev. (%)	Min Return (%)	Max Return (%)
Gold Price	GFC	0.032	1.85	-8.12	6.95
	COVID-19	0.045	1.62	-5.47	5.83
S&P 500	GFC	-0.087	2.94	-9.47	11.58
	COVID-19	0.038	2.13	-11.98	9.05
WTI Crude Oil	GFC	-0.112	3.67	-12.34	13.89
	COVID-19	-0.025	4.82	-38.12	17.45
USD/INR	GFC	0.021	0.78	-3.45	2.98
	COVID-19	0.015	0.54	-2.13	1.87

Gold demonstrated positive mean returns during both crises, recording 0.032% in the GFC and 0.045% in COVID-19, in contrast to the S&P 500 and WTI crude oil, which saw negative returns of -0.087% and -0.112% respectively during the GFC, and near-zero returns for oil at -0.025% during COVID-19. The volatility of gold returns, measured by standard deviation, was lower at 1.85% in the GFC and 1.62% in COVID-19 compared to the S&P 500 (2.94% in GFC, 2.13% in COVID-19) and WTI crude oil (3.67% in GFC, 4.82% in COVID-19), supporting H1's premise of gold's lower volatility. Additionally, extreme daily movements (minimum/maximum returns) were more pronounced for equities and oil, with a notable -38.12% drop in WTI on April 20, 2020, driven by negative oil futures pricing.

3.1 Relationship between gold prices and other variables to assess its safe haven properties

Table 2: Pearson Correlation Coefficients

Variable Pair	GFC	COVID-19
Gold vs. S&P 500	-0.25	-0.18
Gold vs. WTI Crude	-0.31	-0.22
Gold vs. USD/INR	-0.42	-0.35
Gold vs. CPI	0.28	0.33

Gold exhibited negative correlations with the S&P 500 (-0.25 in GFC, -0.18 in COVID-19) and WTI crude oil (-0.31 in GFC, -0.22 in COVID-19), supporting its role as a safe haven during stock market declines (H2), while also showing a negative correlation with USD/INR (-0.42 in GFC, -0.35 in COVID-19), indicating its effectiveness as a hedge against currency depreciation (H3). Additionally, a positive correlation with the CPI (0.28 in GFC, 0.33 in COVID-19) suggests gold's potential as a moderate inflation hedge (H3).

3.2 Volatility Analysis (GARCH Model)

To test H1 (gold prices exhibit lower volatility), a GARCH(1,1) model is applied to daily returns of gold, S&P 500, and WTI crude oil. The model is specified as:

$R_t = \mu + \epsilon_t, \epsilon_t \sim N(0, h_t)$

$h_t = \alpha_0 + \alpha_1 \epsilon_{t-12} + \beta_1 h_{t-1}$

where h_t is conditional variance, α_0 is the constant, α_1 captures short-term shocks, and β_1 reflects persistence.

Table 3: GARCH(1,1) Volatility Estimates

Variable	Period	α0\alpha_0α0 (Constant)	α1\alpha_1α1 (ARCH)	β1\beta_1β1 (GARCH)	Avg. Volatility (%)
Gold	GFC	0.00012	0.08	0.89	1.79
	COVID-19	0.00009	0.06	0.91	1.58
S&P 500	GFC	0.00025	0.12	0.85	2.88
	COVID-19	0.00018	0.1	0.87	2.07
WTI Crude Oil	GFC	0.00038	0.15	0.82	3.59
	COVID-19	0.00045	0.18	0.79	4.75

Gold's average volatility (1.79% in GFC, 1.58% in COVID-19) was significantly lower than that of the S&P 500 (2.88% in GFC, 2.07% in COVID-19) and WTI crude oil (3.59% in GFC, 4.75% in COVID-19), supporting H1, while its lower α(alpha) values (0.08 in GFC, 0.06 in COVID-19) indicate reduced sensitivity to short-term shocks compared to equities and oil, though high β1(beta_1) values suggest persistent volatility across all assets.

3.3 Event Study Analysis

Event study analysis assesses gold's immediate response to key crisis events (H2, H4):

- **GFC Event**: Lehman Brothers collapse (September 15, 2008).
- **COVID-19 Event**: WHO pandemic declaration (March 11, 2020).

Table 4: Cumulative Abnormal Returns (CAR) Around Events

Event	Window	Gold CAR (%)	S&P 500 CAR (%)	WTI CAR (%)
Lehman Collapse	[-5, +5]	4.82	-18.45	-12.67
	[-10, +10]	6.15	-22.13	-15.89
WHO Declaration	[-5, +5]	3.97	-25.78	-28.34
	[-10, +10]	7.43	-30.12	-35.67

Gold displayed positive CARs during key crisis events, with 4.82% and 6.15% in the GFC, and 3.97% and 7.43% in COVID-19, contrasting with the significant negative CARs for the S&P 500 and WTI, thus supporting H2 as a safe haven asset. Additionally, the larger CAR in the [-10, +10] window during COVID-19 (7.43%) compared to the GFC (6.15%) indicates a more pronounced safe haven response, supporting H4.

3..4 Hypothesis Testing

- **H1: Gold prices exhibited lower volatility**: Confirmed by GARCH results showing gold's volatility (1.58–1.79%) was lower than S&P 500 (2.07–2.88%) and WTI (3.59–4.75%).
- **H2: Gold prices increased during stock market declines**: Supported by negative correlations (-0.25 in GFC, -0.18 in COVID-19) and positive CARs during key events.

- **H3: Gold as a hedge against inflation and currency depreciation**: Partially supported; positive CPI correlation (0.28–0.33) and negative USD/INR correlation (-0.42 in GFC, -0.35 in COVID-19) indicate moderate hedging ability.
- **H4: More pronounced safe haven properties in COVID-19**: Supported by higher gold CARs in COVID-19 (7.43%) vs. GFC (6.15%) and sustained positive returns despite initial volatility.

The analysis confirms gold's role as a safe haven asset during both crises, with lower volatility and negative correlations with equities and oil. Its hedging ability against inflation and currency depreciation is evident but less robust, possibly due to short-term market dynamics (e.g., liquidity crunches in March 2020). The stronger safe haven effect during COVID-19 aligns with heightened global uncertainty, corroborating findings from prior studies (e.g., Beckmann et al., 2021).

4. Findings and Conclusions

This part consolidates the empirical findings from the data analysis and draws conclusions regarding gold's role as a safe haven asset during the 2008 Global Financial Crisis (GFC) and the COVID-19 pandemic. The analysis addressed the research objectives—examining gold's safe haven properties, its performance relative to other assets, volatility, investor behavior, and comparative effectiveness across the two crises—and tested the hypotheses (H1–H4). The results provide insights into gold's stabilizing role and inform theoretical and practical implications for investors and policymakers.

4 .1 Summary of Findings

Objective 1: Examine Whether Gold Served as a Safe Haven Asset

- **Finding**: Gold demonstrated safe haven characteristics during both crises. Descriptive statistics showed positive mean returns for gold (0.032% in GFC, 0.045% in COVID-19) while the S&P 500 (-0.087% in GFC) and WTI crude oil (-0.112% in GFC, -0.025% in COVID-19) experienced negative or near-zero returns during crisis peaks. Event study analysis further confirmed this, with gold exhibiting positive cumulative abnormal returns (CARs) of 6.15% (GFC) and 7.43% (COVID-19) over a [-10, +10] window around key events (Lehman Brothers collapse and WHO pandemic declaration), contrasting with significant negative CARs for equities and oil.
- **Hypothesis H2**: Supported—gold prices increased significantly during stock market declines, with negative correlations (-0.25 in GFC, -0.18 in COVID-19) reinforcing its safe haven status.

Objective 2: Analyze Gold's Performance Relative to Stock Market Indices, Crude Oil Prices, and Exchange Rates

- **Finding**: Correlation analysis revealed gold's negative relationship with the S&P 500 (-0.25 in GFC, -0.18 in COVID-19), WTI crude oil (-0.31 in GFC, -0.22 in COVID-19), and USD/INR exchange rate (-0.42 in GFC, -0.35 in COVID-19). This indicates gold moved inversely to equities, oil, and the weakening Indian rupee, particularly during the GFC. The positive correlation with CPI (0.28 in GFC, 0.33 in COVID-19) suggests a moderate hedging role against inflation.
- **Hypothesis H3**: Partially supported—gold acted as an effective hedge against currency depreciation (USD/INR) and inflation (CPI), though the inflation hedge was less pronounced due to moderate correlation strength.

Objective 3: Assess the Volatility of Gold Prices During Financial Instability

- **Finding**: GARCH(1,1) modeling showed gold's volatility (1.79% in GFC, 1.58% in COVID-19) was significantly lower than that of the S&P 500 (2.88% in GFC, 2.07% in COVID-19) and WTI crude oil (3.59% in GFC, 4.75% in COVID-19). Gold's lower ARCH term (α1\alpha_1α1: 0.08 in GFC, 0.06 in COVID-19) indicates reduced sensitivity to short-term shocks compared to equities and oil, supporting its stabilizing role.
- **Hypothesis H1**: Confirmed—gold prices exhibited lower volatility compared to stock market indices and crude oil prices during both crises.

Objective 4: Explore Investor Behavior and Portfolio Allocation Strategies

- **Finding**: The positive CARs during key crisis events (e.g., 4.82% in GFC and 3.97% in COVID-19 over [-5, +5] windows) suggest investors turned to gold as a flight-to-safety asset amid equity and oil market collapses. This aligns with anecdotal evidence of increased gold demand, such as the surge to $2,075 per ounce in August 2020 during the COVID-19 crisis. Portfolio implications are inferred from gold's negative correlation with risk assets, indicating its potential to mitigate losses in diversified portfolios.

Objective 5: Compare Effectiveness Across the Two Crises

- **Finding**: Gold's safe haven properties were more pronounced during the COVID-19 pandemic. Its CAR over a [-10, +10] window was higher in COVID-19 (7.43%) than in GFC (6.15%), and its volatility was lower (1.58% vs. 1.79%). This may reflect greater global uncertainty and monetary stimulus during the pandemic, driving stronger investor demand.
- **Hypothesis H4**: Supported—the safe haven properties of gold were more evident during the COVID-19 pandemic compared to the 2008 GFC.

The findings affirm gold's role as a safe haven asset, consistent with prior studies such as Baur and Lucey (2010), who identified gold's negative

correlation with equities during extreme downturns, and Beckmann et al. (2021), who noted its resurgence during the COVID-19 crisis. The lower volatility (H1) and inverse relationship with stocks and oil (H2) underscore gold's stabilizing effect, particularly during the GFC's credit crunch and the pandemic's equity crash in March 2020. However, its hedging ability against inflation and currency depreciation (H3) was moderate, possibly due to short-term market distortions (e.g., liquidity needs in early 2020) or speculative trading, as noted by Tripathi and Todankar (2021).

The stronger safe haven effect during COVID-19 (H4) aligns with Akhtaruzzaman et al. (2021), who attributed this to unprecedented uncertainty and central bank interventions weakening fiat currencies. In contrast , gold saw greater early volatility during the Great Financial Crisis, most likely as a result of panic selling during the Lehman collapse, as noted by Klein (2017). These differences highlight the influence of crisis type—credit-driven (2008) versus pandemic-driven (2020)—on gold's performance. Gold-based portfolio diversification strategies are supported by price swings and demand surges, which point to a flight-to-safety trend in investor behavior. This supports the claim made by the World Gold Council in 2021 that gold improves risk-adjusted returns in times of crisis.

4.2 Conclusions

The findings of the study concludes that gold had a dependable safe haven asset quality during both the COVID 19 pandemic and 2008 Great Financial Crisis, with particular advantages in each case. It exhibited lower volatility than crude oil and equities, and it gained value during stock market downturns, and offered some protection against inflation and currency depreciation. Its safe haven qualities were more noticeable during the COVID-19 crisis due to monetary policy reactions and increased global uncertainty.

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